

Trend Study 16C-36-04

Study site name: Danish Bench.

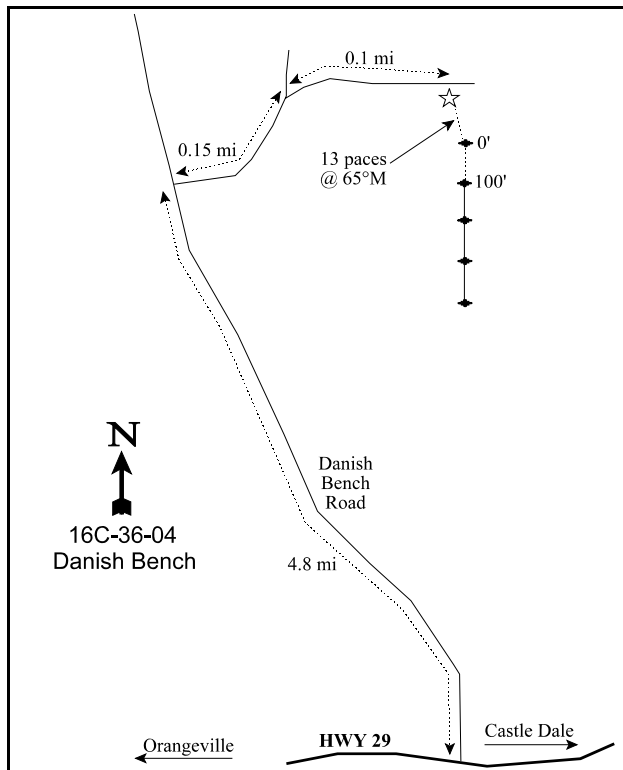
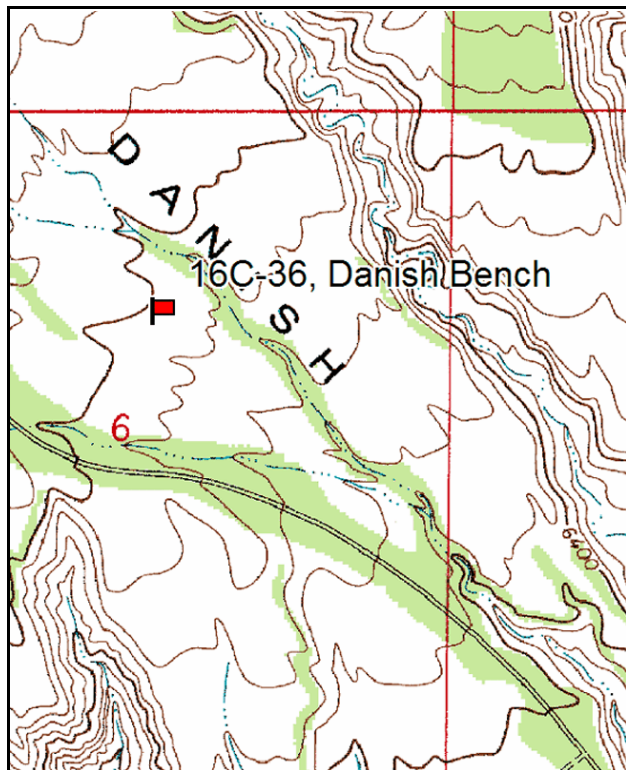
Vegetation type: Chained, Seeded P-J.

Compass bearing: frequency baseline 95 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From Highway 29 between Orangeville and Castle Dale, travel up Danish Bench Road (550 West) 4.8 miles. Turn right and proceed 0.15 miles to a fork in the road. Take the right fork and travel 0.1 mile to a witness post on the right hand side of the road. From the witness post to the 0-foot baseline stake, walk 13 paces at 65°M.



Map Name: Red Point

Diagrammatic Sketch

Township 18S, Range 8E, Section 6

GPS: NAD 27, UTM 12S 4348601 N, 494383 E

DISCUSSION

Danish Bench - Trend Study No. 16C-36

Danish Bench was established in 1994, replacing study 16C-16, Church Mine Road, which has shown little wildlife use over the past several years. The new site is about one-half mile north and is more representative of important big game winter range in the area. This study also samples a seeded pinyon-juniper chaining similar to the Church Mine road study. The aspect is south with a gentle slope of 5%. Elevation is approximately 6,530 feet. Pellet group data from 1999 estimated 17 deer, 76 elk and 12 cow days use/acre (42 ddu/ha, 188 edu/ha, 30 cdu/ha). Moderate elk use was also estimated in 2004 with 43 elk days use/acre (106 edu/ha) estimated. The area is on land administered by the BLM and lies within the Wilberg grazing allotment which allows 89 cows to graze from November 1 to December 15 and again from April 16 to June 15 on two pastures.

The soil is moderately shallow and rocky with some large rocks on the surface and within the soil profile. Effective rooting depth is estimated at almost 13 inches. Soil texture is a sandy clay loam with a slightly alkaline pH (7.5). Percent organic matter is limited at only 1.8%. Phosphorus is also marginal at 7.8 ppm. Values less than 10 ppm can limit plant growth and development. Rock and pavement cover are high averaging 25% in 1994 and 44% in 2004. Litter cover is relatively low, estimated at only 24% in 1994 and 18% in 2004. There is a considerable amount of unprotected bare soil on the site. Total vegetation cover is low at only 17% to 18%. There is some localized soil movement noticeable, yet erosion is minimal due to the gentle terrain and adequate protective ground cover. The erosion condition class determined soil movement as slight in 2004.

The dominant browse on the site consists of a moderately low population of black sagebrush. Density has increased slightly from 1,540 plants/acre estimated in 1994 to 1,860 in 2004. Vigor has been good during all readings and the number of decadent plants have been low. Utilization was light in 1994 but moderate to heavy in 1999 and 2004. Small numbers of other desirable shrubs occur on the site. These include true mountain mahogany, green ephedra, cliffrose, and antelope bitterbrush. Mahogany and bitterbrush are heavily browsed, while use of cliffrose and ephedra have been moderate to heavy. Juniper and pinyon trees are increasing on the site. They provided 33% of the browse cover in 2004. Point-center quarter data from 2004 estimated an average of 110 juniper and 54 pinyon trees/acre. Average diameter of the juniper was estimated at 2.2 inches while pinyon averaged 2.6 inches. Data shows a stable population of pinyon and juniper. About half of the juniper and pinyon trees are in the around 4 feet in height.

The herbaceous understory is poor and has produced only 8% to 9% total cover on the site during any reading. Crested wheatgrass accounted for 66% of the grass cover in 1994 and 92% in 1999. Drought conditions have caused a major decline in cover and abundance for crested wheatgrass by 2004. It accounted for only 18% of the total grass cover in 2004 with a cover value of less than 1%. Indian rice grass is also fairly abundant. Total grass cover has ranged from a high of only 8% in 1994 to just under 4% in 2004. Forbs are insignificant. They made up just over 1% total cover in 1994 and 1999, increasing to nearly 4% in 2004. Common perennial species include golden cryptantha, green thread, hoary townsendia, and fendler euphorbia.

1994 APPARENT TREND ASSESSMENT

Protective ground cover seems well distributed and erosion is currently minimal. Further increases in tree density will come at the cost of herbaceous plants. This will eventually increase the erosion problems on this site. The browse component contains several preferred species of shrubs yet none are very abundant. Black sagebrush is the only abundant shrub and the trend for this species appears stable due to a good young recruitment, low decadency, and light utilization. The herbaceous understory is diverse but not very abundant. The Desirable Components Index (see methods) rated this site as very poor with a score of 32 due to low shrub cover, few young shrubs, high decadence, and moderate grass cover.

winter range condition (DC Index) - 32 (very poor) Black sagebrush - chaining type

1999 TREND ASSESSMENT

Trend for soil is stable due to similar ground cover characteristics compared to 1994. There is some localized erosion occurring but it is not serious due to the gentle terrain combined with the well distributed protective ground cover. Trend for browse is also stable. Black sagebrush has increased slightly in density, while showing heavier use. Green ephedra provides some additional browse forage on the site. It has increased from 60 to 340 plants/acre since 1994. Use is moderate to heavy with vigor poor on 35% of the plants sampled. There are several other shrub species on the site yet they occur in very small numbers. Trend for the herbaceous understory is stable but poor. Total cover of grasses and forbs is only 9%. Sum of nested frequency for perennial grasses has declined slightly while frequency of forbs has increased. Crested wheatgrass is still dominant and currently provides 92% of the grass cover and 78% of the herbaceous cover. Indian ricegrass was moderately abundant in 1994, although it has since declined in nested frequency. Forbs are insignificant and currently provide only about 1% cover. Several new species were encountered in 1999. The Desirable Components Index rated this site as very poor with a score of 33 due to low shrub cover, few young shrubs, high decadence, and moderate grass cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - stable (3)

winter range condition (DC Index) - 33 (very poor) Black sagebrush - chaining type

2004 TREND ASSESSMENT

Trend for soil remains stable with similar ground cover characteristics compared to 1999. One negative aspect is the decline in perennial grass cover and a very slight decline in the ratio of protective ground cover (vegetation, litter, and cryptogams) to bare ground. There is some localized erosion occurring and the erosion condition class determined erosion as slight. Trend for browse is stable. The key browse species, black sagebrush has increased slightly in density, vigor is good, and decadence low. Utilization remains moderate to heavy. Green ephedra is of secondary importance. It provides 19% of the total browse cover and has increased in density to 580 plants/acre. Age class analysis indicates an expanding population. Other desirable shrubs, true mountain mahogany, cliffrose, and bitterbrush, occur in very low numbers. Trend for the herbaceous understory is down. Sum of nested frequency of perennial grasses declined substantially due to a significant decline in the nested frequency of crested wheatgrass. Average cover of crested wheatgrass declined ten-fold from a cover value of nearly 7% to less than 1%. Nested frequency of Indian rice grass increased significantly. Perennial forbs increased in sum of nested frequency and cover rose from 1.3% to nearly 4%. The composition is diverse but common species, golden cryptantha, green thread, hoary townsendia, and fendler euphorbia provide little forage. Total herbaceous cover remained stable at about 8%, but the overall trend is considered down due to the loss of the primary grasses, crested wheatgrass. Declines in crested wheatgrass have been noted on several trend study sites in the state due to the severe drought conditions of the past several years. The Desirable Components Index (see methods) rated this site as poor with a score of 43 due to low shrub cover, several young shrubs, moderate decadence, and a decrease in grass cover.

TREND ASSESSMENT

soil - stable (3)

browse - stable (3)

herbaceous understory - down (1)

winter range condition (DC Index) - 43 (poor) Black sagebrush - chaining type

HERBACEOUS TRENDS --

Management unit 16C, Study no: 36

Type	Species	Nested Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
G	Agropyron cristatum	_b 279	_b 299	_a 33	5.41	6.72	.68
G	Agropyron intermedium	3	-	-	.00	-	-
G	Elymus junceus	5	3	6	.00	.15	.06
G	Elymus salina	2	-	4	.06	-	1.00
G	Oryzopsis hymenoides	_{ab} 54	_a 29	_b 67	2.64	.41	2.08
G	Sitanion hystrix	5	-	-	.01	-	.00
Total for Annual Grasses		0	0	0	0	0	0
Total for Perennial Grasses		348	331	110	8.14	7.28	3.84
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F	Caulanthus crassicaulis	12	2	1	.04	.01	.03
F	Chenopodium fremontii (a)	_a -	_a -	_b 25	-	-	.05
F	Cryptantha confertiflora	_b 53	_a 15	_b 38	1.23	.28	.52
F	Descurainia pinnata (a)	-	-	20	-	-	.09
F	Eriogonum alatum	9	11	18	.03	.12	.11
F	Euphorbia fendleri	21	15	27	.04	.04	.35
F	Gilia spp. (a)	_a -	_a 1	_b 42	-	.00	.40
F	Hymenoxys acaulis	_a 23	_b 35	_a 20	.08	.32	.08
F	Leucelene ericoides	-	4	-	-	.06	-
F	Machaeranthera grindelioides	-	3	-	-	.03	-
F	Medicago sativa	-	-	2	-	-	.03
F	Penstemon spp.	_a -	_b 20	_a -	-	.07	-
F	Penstemon pachyphyllus	8	2	10	.03	.00	.03
F	Schoenocrambe linifolia	-	2	-	-	.00	.00
F	Thlaspi montanum	-	3	-	-	.00	-
F	Thelesperma subnudum	_a 7	_{ab} 16	_b 27	.01	.08	.18
F	Townsendia incana	_a -	_b 68	_c 122	-	.26	2.24
F	Unknown forb-perennial	4	-	4	.01	-	.18
Total for Annual Forbs		0	1	87	0	0.00	0.55
Total for Perennial Forbs		137	196	269	1.48	1.30	3.76
Total for Forbs		137	197	356	1.48	1.30	4.32

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Management unit 16C, Study no: 36

Type	Species	Strip Frequency			Average Cover %		
		'94	'99	'04	'94	'99	'04
B	Artemisia nova	18	21	22	1.16	1.79	3.58
B	Cercocarpus montanus	1	1	1	1.08	.78	.63
B	Chrysothamnus viscidiflorus	0	0	1	-	-	-
B	Cowania mexicana stansburiana	0	0	1	-	-	.15
B	Ephedra viridis	2	9	9	2.01	1.77	2.29
B	Eriogonum microthecum	29	26	40	.09	.07	.60
B	Gutierrezia sarothrae	0	5	31	-	.04	.71
B	Juniperus osteosperma	0	5	4	2.76	2.77	3.57
B	Opuntia spp.	0	0	1	-	-	-
B	Pinus edulis	0	2	2	.15	.38	.38
B	Purshia tridentata	3	1	0	.00	.15	-
B	Yucca harrimaniae	2	2	2	.63	-	.03
Total for Browse		55	72	114	7.92	7.77	11.97

CANOPY COVER, LINE INTERCEPT --

Management unit 16C, Study no: 36

Species	Percent Cover	
	'99	'04
Artemisia nova	-	2.46
Cercocarpus montanus	-	1.13
Cowania mexicana stansburiana	-	.15
Ephedra viridis	-	1.89
Eriogonum microthecum	-	.18
Gutierrezia sarothrae	-	1.83
Juniperus osteosperma	.80	3.18
Pinus edulis	-	.55

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 16C, Study no: 36

Species	Average leader growth (in)
	'04
Artemisia nova	1.5
Cercocarpus montanus	4.4

POINT-QUARTER TREE DATA --
Management unit 16C, Study no: 36

Species	Trees per Acre	
	'99	'04
Juniperus osteosperma	110	110
Pinus edulis	56	54

Average diameter (in)	
'99	'04
2.6	2.4
2.0	2.6

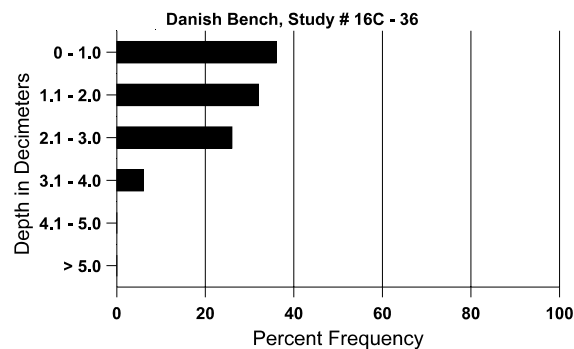
BASIC COVER --
Management unit 16C, Study no: 36

Cover Type	Average Cover %		
	'94	'99	'04
Vegetation	16.53	17.78	18.81
Rock	16.90	13.17	13.60
Pavement	7.61	16.29	30.38
Litter	23.86	20.95	17.67
Cryptogams	.06	1.53	.01
Bare Ground	29.31	30.11	29.64

SOIL ANALYSIS DATA --
Management unit 16C, Study no: 36, Study Name: Danish Bench

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	ds/m
12.8	63.7 (14.0)	7.5	56.0	21.4	22.6	1.8	7.8	140.8	0.9

Stoniness Index



PELLET GROUP DATA --

Management unit 16C, Study no: 36

Type	Quadrat Frequency		
	'94	'99	'04
Rabbit	36	29	24
Elk	22	57	41
Deer	19	10	16
Cattle	-	3	-

Days use per acre (ha)	
'99	'04
-	-
76 (188)	43 (106)
17 (42)	5 (12)
12 (30)	2 (5)

BROWSE CHARACTERISTICS --

Management unit 16C, Study no: 36

		Age class distribution (plants per acre)					Utilization					
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Artemisia nova</i>												
94	1540	20	220	1320	-	20	3	0	0	-	0	11/19
99	1700	-	380	1100	220	20	42	12	13	1	1	6/16
04	1860	560	100	1580	180	20	68	10	10	8	8	7/18
<i>Cercocarpus montanus</i>												
94	20	-	-	20	-	-	0	100	0	-	0	46/55
99	20	20	-	20	-	-	100	0	0	-	0	50/55
04	20	-	-	-	20	-	0	100	100	100	100	46/50
<i>Chrysothamnus viscidiflorus</i>												
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	20	-	-	20	-	-	0	0	-	-	0	6/9
<i>Cowania mexicana stansburiana</i>												
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	11/23
04	20	-	-	20	-	-	100	0	-	-	0	19/25
<i>Echinocereus</i> spp.												
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	6/17
04	0	-	-	-	-	-	0	0	-	-	0	-/-
<i>Ephedra viridis</i>												
94	60	-	-	60	-	-	0	0	0	-	0	31/46
99	340	-	40	260	40	20	29	29	12	6	35	32/42
04	580	-	200	300	80	-	38	21	14	10	14	33/43

		Age class distribution (plants per acre)					Utilization					
Y e a r	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Eriogonum microthecum</i>												
94	1880	60	100	1740	40	-	0	0	2	-	0	2/4
99	1160	40	140	980	40	20	7	7	3	2	2	1/3
04	2320	280	140	2140	40	20	29	9	2	-	0	2/3
<i>Gutierrezia sarothrae</i>												
94	0	-	-	-	-	-	0	0	-	-	0	7/9
99	460	140	340	120	-	-	0	0	-	4	0	4/4
04	5080	-	440	4640	-	20	1	0	-	-	0	6/9
<i>Juniperus osteosperma</i>												
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	120	-	80	40	-	40	0	0	-	17	0	-/-
04	80	-	40	40	-	-	0	0	-	-	0	-/-
<i>Leptodactylon pungens</i>												
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	0	-	-	-	-	-	0	0	-	-	0	-/-
04	0	-	-	-	-	-	0	0	-	-	0	6/10
<i>Opuntia</i> spp.												
94	0	-	-	-	-	-	0	0	-	-	0	4/12
99	0	-	-	-	-	-	0	0	-	-	0	4/16
04	20	-	-	20	-	-	0	0	-	-	0	4/17
<i>Pinus edulis</i>												
94	0	-	-	-	-	-	0	0	-	-	0	-/-
99	40	20	40	-	-	-	0	0	-	-	50	-/-
04	40	-	20	20	-	-	0	0	-	-	0	-/-
<i>Purshia tridentata</i>												
94	60	-	-	60	-	-	0	0	-	-	0	19/22
99	20	-	-	20	-	-	0	100	-	-	0	19/22
04	0	-	-	-	-	-	0	0	-	-	0	4/16
<i>Yucca harrimaniae</i>												
94	80	-	-	80	-	-	0	0	-	-	0	14/25
99	40	-	-	40	-	100	0	0	-	-	0	9/12
04	100	-	100	-	-	-	0	0	-	-	0	-/-